Task Order 12-10

1. Title of Effort: Constellation Support

2. Task Description:

The contractor shall provide Constellation Program Integration and Support to Constellation Program SRQA functions.

2.1 SOW Reference: Section C, Subsections 5.0, and 6.0

2.2 Requirements

2.2.1 Cx SR&QA System Safety

Provide engineering expertise in the areas of systems safety and reliability in representing CxP SR&QA at Level II technical forums. Evaluate systems engineering solutions to technical issues, provide inputs to integrated hazard analyses, and evaluate and assess risk associated with the Program's approach to designing and operating the Constellation architecture.

2.2.1.1 Integrated Hazard Analysis

a. Participate in intercenter analysis team to develop hazard/hazard cause structure and to assign hazard tasks to centers for development.
b. As required, provide assistance to Cx SE&I in conducting Integrated Hazard Analyses and developing Integrated Hazard Reports in accordance with CxP 70038.
c. Report progress on hazard reports database and reconcile the difference between the master matrix and hazard reports database; update the IHA weekly status metrics.

2.2.1.2 Constellation Boards, Panels, and Working Groups

a. Provide technical support to the Constellation SR&QA Board.
b. Provide technical support to the Cx Safety Engineering Review Panel (CSERP), Reliability and Maintainability Panel.
c. Perform/provide qualitative and/or quantitative risk assessments of the baselining of or changes to program requirements and element interface requirements or specifications.
d. Identify impacts to Integration Hazard Reports posed by changes, issues, or decisions pending at Program boards, panels, and working groups.
e. Evaluate qualitative and/or quantitative risk assessments provided by Cx elements/project offices for items that represent an increase in risk to Cx safety and mission success.
f. Identify impacts to Integration of changes to element-specific documentation.
g. Identify and recommend program and element document updates as appropriate for integration.
h. Provide room setup for JSC CSERP meetings, including logistical functions such as room seating arrangement as well as establishing and maintaining teleconferencing connections, as required. For meetings held at remote locations, the room setup will be provided by the organization hosting the meeting.
i. Establish and maintain online chart viewing via internet meeting conferencing services. For meetings held at remote locations, online chart viewing and teleconferencing support will be provided remotely by personnel at JSC unless it is determined that this cannot be accomplished, necessitating travel to the specific remote location.

2.2.1.3 Design Evaluation & Review

a. Evaluate deliverables and assess overall technical risk as part of major Program and element milestones. Verify compliance to Program SR&QA requirements. Develop review item dispositions and/or comments and participate in the resolution of issues related to safety and mission success.

2.2.1.4 Human Rating

a. Provide crew survival expertise to design and analysis activities including hazard analysis and systems engineering.
b. Evaluate system compliance to NASA human rating requirements. Identify issues and recommend solutions.

2.2.2 Risk Management and Analysis

2.2.2.1 Probabilistic Risk Assessment

a. Develop assigned portions of the Cx Program PRA to be integrated into the system-level model.
b. Provide system modeling, data analysis, systems and subsystems engineering, operations, and other expertise to the development of the model and reduction and application of probability data.
c. Participate in the Cx PRA Panel and the Cx PRA Working Group.
d. Provide technical support to the integrated PRA development team.

2.2.2.2 Trade Studies

a. Participate in trade studies such as design analysis cycles or targeted studies to identify potential safety and mission risks and evaluate design options.
b. Using appropriate safety and reliability analysis tools, provide risks and risk rankings to study team(s).
c. Develop mitigation strategies in collaboration with study team members.
d. Develop reports and presentations as required to document findings.

2.2.3 CxP SR&QA Management and Control

2.2.3.1 CxP SRQA Office Support

a. Secretariat for the Cx SR&QA Board. Coordinate with Board Chair / presenters / meeting support to ensure Board timeliness and success.
b. Project manager for Cx SR&QA Windchill website: Manage folder structure and access controls for data on the Cx SR&QA Windchill site. Manage invitations and user roles ensuring proper access across the Program.
c. Configuration Management support: Assist Cx SR&QA in writing and processing Change Requests. Submit Cx SR&QA CR Evaluations to the Configuration Management Office. Coordinate weekly CR prebrief meetings for Board representative.
d. Cx SR&QA Office support: Update Cx SR&QA Calendar with Cx SR&QA meetings, travel schedules, and vacation/leave. Coordinate with Cx SR&QA Scheduler to provide input for SR&QA portion of the Integrated Master Schedule. Assist with Cx Program SRR as well as Project level SRRs. Provide real time support for SR&QA Documentation Team. Assist with collecting/submitting documents and presentations for documentation reviews. Presentation building, budget review integration, memo distribution, and general administrative support.

2.2.3.2 Systems Engineering & Integration (SE&I)

a. Provide technical support to the Cx SR&QA representative to the Cx Systems Engineering and Integration Office.
b. Provide technical support to Systems Integration Groups (SIGs) as required.
c. Identify risks from Cx integrated hazard analysis effort requiring review, assessment, or further analysis by the SIGs.
d. Provide recommendations to SIGs regarding the safety and reliability implications of Cx systems.
e. Assist in development of SR&QA requirements for the technical performance of the Constellation system with respect to safety, availability, and mission success.
f. Assist in development of programmatic requirements driving implementation and commonality of SR&QA functions across the Program.
g. Support coordination and resolution of changes or issues dealing with Program SR&QA requirements.

h. Assist in evaluation of risks to program success posed by pending Program decisions during DDT&E and the reporting of results to the SR&QA Director.

2.2.3.3 Constellation Operations, Test and Integration

a. Support ground and flight test program test requirement and objective development, including test verification requirement planning.
b. Provide technical support to the Cx Flight Test Working Group as Cx SRQA representative to the group.
c. Perform SR&QA technical risk assessments.
d. Perform operational risk assessments for operations associated with ISS and lunar sortie missions.
e. Work with the operations managers to identify, track and resolve safety issues and concerns associated with Constellation flight hardware and operations.
f. Perform/provide qualitative and/or quantitative risk assessments in support of Constellation Program operations boards and panels. Change request (CR) evaluations are provided to the Board Representatives for each respective board.
g. Assess hazards associated with joint Constellation/ISS operations.

2.2.4 Cx Reliability and Maintainability

2.2.4.1 Panel and Board Support

a. Provide technical support to the Cx Reliability and Maintainability Panel as needed
b. Participate in Program and Project level boards on an as needed basis.

2.2.4.2 Trade Studies

a. Participate in trade studies and provide R&M expertise and analysis support to ensure R&M requirements compliance.
b. Provide R&M analyses to support Program level initiatives.

2.2.4.3 R&M Integration

a. Assist in the coordination of S&MA policies, requirements, issues between Constellation Program and Orion Project S&MA.
b. Provide analytical support to address key Orion technical design issues as directed by Level II R&M.
c. Review Project level FMEAs for potential integrated hazardous effects from system and element failure modes.

2.2.4.4 Surveillance Support

a. Participate in program and project level reviews.
b. Provide review of various program and project analyses.
c. Provide review of project documents and deliverables.

3.0 DELIVERABLES

Change Request evaluations
PRA analysis results (i.e., LOC/LOM)

4.0 PERIOD OF PERFORMANCE: October 1, 2009 – April 30, 2010

5.0 ESTIMATED COSTS:

Contractor may provide travel, training, materials, and other non-labor resources as necessary to support task order requirements. Training may include selected professional discipline-based or spaceflight-based conferences with approval of the TMR.